

CLAIMS

What is claimed is:

1. A subscriber line transceiver apparatus, comprising:
  - an integrated circuit coupling at least one of an upstream and a downstream voice path for carrying voice signals to a subscriber line, wherein the integrated circuit couples at least one of an upstream and a downstream data path for carrying data signals to the subscriber line, wherein the voice signals are communicated within a first frequency range, wherein the data signals are communicated within a second frequency range, wherein the first and second frequency ranges are distinct.
2. The apparatus of claim 1 wherein the integrated circuit further comprises:
  - a driver for driving a downstream voice signal onto the subscriber line.
- 15 3. The apparatus of claim 1 wherein the integrated circuit further comprises:
  - a driver for driving a metering signal onto the subscriber line.
4. The apparatus of claim 1 wherein the integrated circuit further comprises:
  - 20 a driver for driving a downstream data signal onto the subscriber line.
5. The apparatus of claim 1 wherein the integrated circuit further comprises:
  - a driver for driving a downstream voice signal and a downstream data signal onto the subscriber line.

6. The apparatus of claim 1 wherein the integrated circuit further comprises:

receiver circuitry for receiving upstream voice signal from the subscriber line.

5 7. The apparatus of claim 1 wherein the integrated circuit further comprises:

receiver circuitry for receiving upstream data signals from the subscriber line.

10 8. The apparatus of claim 1 wherein the integrated circuit further comprises:

receiver circuitry for receiving upstream data signals and upstream voice signals from the subscriber line.

9. The apparatus of claim 1 wherein the integrated circuit further comprises:

15 driver circuitry for driving at least one of a downstream voice signal and a downstream data signal onto the subscriber line; and

receiver circuitry for receiving at least one of an upstream voice signal and an upstream data signal from the subscriber line.

20 10. The apparatus of claim 1 wherein the first frequency range has an

upper bound of approximately 4 kHz.

11. A subscriber line transceiver apparatus, comprising:

a first receiver circuit for extracting upstream voice signals carried by a subscriber line, wherein the first receiver circuit substantially eliminates any signals outside of a first frequency range associated with voiceband communications to provide the upstream voice signals; and

25 a second receiver circuit for extracting upstream data signals from the subscriber line, wherein the second receiver circuit substantially eliminates

any signals outside of a second frequency range associated with data communications to provide the upstream data signals, wherein the first and second receiver circuits reside on a same integrated circuit die.

12. The apparatus of claim 11:

5       wherein the first receiver circuit further comprises a first driver for driving the upstream voice signals; and

      wherein the second receiver circuit further comprises a second driver for driving the upstream data signals.

13. The apparatus of claim 12:

10      wherein the first receiver circuit further comprises a first pass filter coupled to the first driver, wherein the first filter substantially excludes any signals outside of the first frequency range; and

      wherein the second receiver circuit further comprises a second pass filter coupled to the second driver, wherein the second filter substantially excludes any signals outside of the second frequency range.

14. The apparatus of claim 13 wherein the first filter is a low pass filter.

15. The apparatus of claim 13 wherein the second filter is a high pass filter.

16. The apparatus of claim 11:

20      wherein the first receiver circuit further comprises a first hybrid filter coupled to the first driver, wherein the first hybrid and first driver co-operate to eliminate downstream voiceband signals; and

      wherein the second receiver circuit further comprises a second hybrid filter coupled to the second driver, wherein the second hybrid and second driver co-operate to eliminate downstream data signals.

25 17. The apparatus of claim 11:

      wherein the first receiver circuit further comprises:

- a first driver for driving the upstream voice signals;
- a first hybrid filter for eliminating downstream voice signals from the received subscribe line signals;
- a first pass filter for eliminating any signals outside of the first frequency range, wherein the first driver, first hybrid filter, and first pass filter co-operate to provide the upstream voice signals from the subscriber line to the exclusion of any other signals carried by the subscriber line;
- wherein the second receiver circuit further comprises:
- a second driver for driving the upstream data signals;
- a second hybrid filter for eliminating downstream data signals from the received subscriber line signals; and
- a second pass filter for eliminating any signals outside of the second frequency range, wherein the second driver, second hybrid filter, and second pass filter co-operate to provide the upstream data signals from the subscriber line to the exclusion of any other signals carried by the subscriber line.
18. The apparatus of claim 11 wherein an upper bound of the first frequency range is approximately 4 kHz.
19. The apparatus of claim 11 wherein a lower bound of the second frequency range is approximately 25 kHz.
20. The apparatus of claim 11 wherein the upstream voiceband signal is an unmodulated signal.
21. The apparatus of claim 11 wherein the upstream data signal is a modulated signal.
- 25 22. The apparatus of claim 21 wherein the upstream data signal uses a discrete multi-tone (DMT) modulation line code.

23. The apparatus of claim 21 wherein the upstream data signal uses a carrierless amplitude and phase (CAP) modulation line code.
24. The apparatus of claim 21 wherein the upstream data signal uses a two binary 1 quaternary (2B1Q) line code.
- 5 25. The apparatus of claim 21 wherein the upstream data signal uses a quadrature amplitude and phase modulation (QAM) line code.